

Article

Why Feel Powerless to Breastfeed? ——A Narrative Review of Psycho-social Factors Influencing Breastfeeding under the Theory of Planned Behavior (TPB)

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Abstract: Psycho-social factors are key factors to the powerlessness of infant mothers who breastfeed. As the theory of planned behavior (TPB) is widely used to investigate the correlation between psycho-social factors and breastfeeding behavior, this study aims to examine the utility of TPB constructs to predict breastfeeding behavior and understand TPB-based psycho-social factors' effectiveness on breastfeeding behavior. A narrative review consulting Web of Science, Scopus, Ebsco, PubMed, and PsycInfo in English and Chinese has been conducted, with the inclusion of twenty studies published between January 2000 and May 2022. It is reported that psycho-social factors based on TPB for breastfeeding such as affective attitude, instrumental attitude, subjective norm, perceived behavioral control (including self-efficacy), moral norm, breastfeeding knowledge, and self-identity can effectively explain the breastfeeding behavior. Future research should improve the theoretical model of TPB-based breastfeeding and implement more localized prediction and intervention studies on breastfeeding.

Keywords: Breastfeeding; The theory of planned behavior; Psycho-social Factors

1. Introduction

Breastfeeding refers to the act of feeding babies by mother's breastmilk, which is conducive to the health of the infant and mother, as well as the mother-infant relationship [1]. The World Health Organization has advocated breastfeeding for nearly two decades, recommending that mothers exclusively breastfeed their infants within the first six months of life and continue breastfeeding up to two years of age or beyond[2]. A great number of pregnant women have recognized the benefits of this feeding approach by showing breastfeeding willingness. However, breastfeeding rates remain low in countries and regions where infant formula is a common option. To exemplify, in 2019, China reported an exclusive breastfeeding rate for infants aged 0-6 months at only 29.2%, well below the international average of 42%[3]. This infers that the majority of mothers feel "powerless" during breastfeeding, which means they are likely to discontinue breastfeeding during the actual feeding process despite knowing the benefits of breastfeeding and intending to breastfeed .

Why feel powerless to breastfeed? From the perspective of breastfeeding intervention, international nursing researchers have adopted a macroscopic understanding of the variables that may influence breastfeeding behavior[4]. These studies demonstrate that the vast majority of mothers may discontinue their breastfeeding due to "insufficient breastmilk". Such inadequacy caused by physiological factors is extremely rare, whereas "insufficient breastmilk" induced by psycho-social factors is prevalent[5]. Psycho-social factors are usually grouped as individual psychological factors such as experience, attitude, or feeling, and

social and environmental factors like environmental stress, family support, and medical service[6].

The theory of self-efficacy in breastfeeding, the theory of reasoned behavior, and the theory of planned behavior(TPB) are commonly employed in social psychology to investigate the associations between different psycho-social factors and breastfeeding behavior. The theory of self-efficacy in breastfeeding discovers whether the infant mother’s breastfeeding experience, observational learning from significant others, and emotional relaxation will influence breastfeeding behavior[7]. In terms of the theory of reasoned behavior, how infant mothers’ attitudes and the environment’s subjective norms pose impacts on breastfeeding behavior gets studied. Based on the theory of reasoned behavior, perceived behavioral control is added in TPB to investigate the influence of infant mothers’ sense of control over breastfeeding behavior[8]. The theory of self-efficacy in breastfeeding focuses on the influence of individual psychological factors, while the theory of reasoned behavior further emphasizes the effect of social and environmental factors. Compared with the two established theories, in TPB, the influences of individual psychological factors, social environmental factors, and control factors on breastfeeding behavior are endowed with equal importance, which can provide a more exhaustive answer to the question about how psycho-social factors influence breastfeeding behavior[9].

Researchers have attempted a series of examinations and validation of the TPB model of breastfeeding behavior from different perspectives and systematic review studies that explore the application and development of TPB in breastfeeding research are accessible[10]. However, the majority of available studies examined their effects on breastfeeding only regarding one or a few psycho-social factors. Moreover, the existing reviews of breastfeeding behavior mostly have focused on exploring the macro explanatory power of different theoretical models of breastfeeding behavior[9,11]or analyzing breastfeeding behavior using only the core TPB variables (attitudes, subjective norms, and perceived behavioral control)[4,10]. Therefore, it is difficult for researchers to systematically and comprehensively sort out the specific effectiveness of each TPB-based psycho-social factor on breastfeeding behavior.

Questions are then proposed: How exactly do the psycho-social factors influence breastfeeding behavior when taken as a whole? How have these factors been investigated and identified? In brief, integrated research and analysis conducted on this topic remain inadequate. This study uses TPB as an integrated theoretical framework to sort out the influence of various psycho-social factors on breastfeeding behavior and analyze the psycho-social factors that feature greater predictive power of breastfeeding as the reference for empirical and intervention studies to motivate breastfeeding behavior.

2. Methods

The narrative review was undertaken in September 2021 and updated in May 2022 on Web of science, Scopus, Ebsco, PubMed and PsycInfo. The searches on the title, abstract, and keywords were conducted, including the following terms: (the theory of planned behavior OR TPB) and (breastfeeding OR breast milk OR breastfeed), and (psychosocial factors OR psycho-social factors OR factors).

Duplicates were removed before the initial screening. Three members of our research team assessed the suitability of the abstracts of the studies chosen to be included. The inclusion criteria are set as follows: (1) articles written in English or Chinese, (2) papers published in peer-reviewed academic journals between 30 January 2000 and 20 May 2021, and (3) original studies (quantitative, qualitative, or studies of mixed methods), reviews and pre-prints. Other grey literature got excluded because this study aims at examining peer-reviewed papers to largely ensure the quality of the selected studies and to conduct the most systematic search to the best of our ability. Following the preliminary examination, discrepancies were discussed with the entire research team.

To chart the data, three members of our research team independently retrieved basic information about the articles as well as specific aspects of the content, including

demographic characteristics of the sample, measurement instruments used in studies, intervention details, type of publication/research, the methodology, participants, conclusions, recommendations, and limitations. The results were then assessed in order to identify and eliminate any inconsistencies. Finally, to summarize and report the process and the results, our research team used the checklist of PRISMA extension for scoping reviews (PRISMA-ScR), a 22-item list designed to provide guidance on reporting this type of review[12]. An overview of the selection process, according to the preferred reporting items for systematic reviews and the PRISMA flow diagram, is presented in Figure 1.

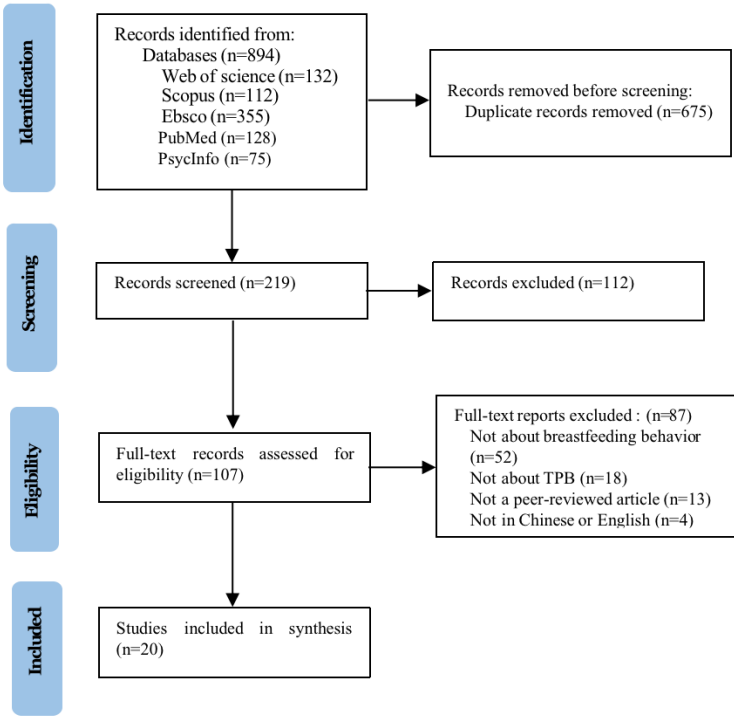


Figure 1. Flow diagram of the search and selection process.

3. Results

After removing duplicates, a total of 219 citations were identified from electronic database searches and review article references. 112 were excluded based on the title and abstract, leaving 107 full text articles to be retrieved and evaluated for eligibility. Among these articles, 87 were excluded for the following reasons: 52 studies did not specifically examine breastfeeding behavior, 18 studies did not utilize TPB exclusively, 13 studies were not regarded as peer-reviewed studies, and 4 studies did not use either English or Chinese. The remaining 20 studies were identified as eligible for this review. The main characteristics and findings of reviewed studies are presented in Table 1.

Table 1. General information of selected articles.

Article Based on “QualSyst”	Country	Study design	Participate(N)	Objective	Conclusion	Quality Assessment
Factors influencing exclusive breastfeeding among Iranian mothers: A longitudinal population-based study[13]	Iran	Longitudinal Study	1445	To identify the determinant factors in order to improve the practice of exclusive breastfeeding among Iranian mothers.	The interventions to promote knowledge, attitude and behavioral control towards the exclusive breastfeeding should be considered especially in the young mothers with low socio-economic status.	1.50
Predicting intention and maintenance of breastfeeding up to 2-years after birth in primiparous and multiparous women[14]	Italy	Longitudinal study	155	To examine the predictors of intention and maintenance of breastfeeding up to 2-years in both primiparous and multiparous women.	Promoting intentions may be a useful way to increase breastfeeding duration to 2-years. Targeting attitudes, norms and PBC may be one way to increase intentions.	1.71
Explaining infant feeding: The role of previous personal and vicarious experience on attitudes, subjective norms, self-efficacy, and breastfeeding outcomes[15]	UK	Prospective cohort	149	To examined the relationships between personal and vicarious experience of infant feeding, self-efficacy, the theory of planned behaviour variables of attitudes and subjective norm, and the likelihood of breastfeeding at 6–8 weeks post-natally.	Vicarious experience, particularly of formula-feeding, has been shown to influence the behaviour of first-time and experienced mothers both directly and indirectly via attitudes and subjective norm.	1.43
Father’s Knowledge, Attitude and Support to Mother’s Exclusive Breastfeeding Practices in Bangladesh: A Multi-Group Structural Equations Model Analysis[16]	Bangladesh	Cross-sectional	332	To investigate the role of fathers’ knowledge, attitude and support in formulating mothers’ the practice of breastfeeding taking Bangladeshi parental cases as a sample.	The study finds that a father’s knowledge can significantly enhance mother’s knowledge and can enhance his own attitude to offer different support to his partner/wife which induces the chances of EBF practices by mothers.	1.64
Impact of an educational intervention on breastfeeding behaviour among pregnant women[17]	Iran	Prospective cohort	100	To survey the application of theory of planned behaviour in breastfeeding behaviour among pregnant women in Fasa City, Iran.	This study showed the effectiveness of the intervention based on the theory of planned behaviour constructs in adoption of breastfeeding behaviour post-intervention in women.	1.64
The Role of Social-Cognitive and Emotional Factors on Exclusive Breastfeeding Duration[18]	UK	Cross-sectional	375	To determine whether social-cognitive variables, fear, regret, and self-conscious emotions predict exclusive breastfeeding duration. The secondary aim of this research was to assess whether these factors predict infant-feeding choice.	The authors argue that it is important to consider the role of self-conscious emotions and regret on exclusive breastfeeding.	1.43
Effect of Education Based on Extended Theory of Planned Behavior on Exclusive Breastfeeding in Pregnant Women in Daarmian in 2017[19]	Iran	prospective cohort	168	To evaluate the effects of educational intervention based on the extended theory of planned behavior.	The structure of the extended theory of planned behavior is a suitable framework to promote exclusive breastfeeding among pregnant women.	1.36

Table 1. General information of selected articles.

Article Based on "QualSyst"	Country	Study design	Participate(N)	Objective	Conclusion	Quality Assessment
Employing an extended Theory of Planned Behaviour to predict breastfeeding intention, initiation, and maintenance in White British and South-Asian mothers living in Bradford[20]	UK	Cross-sectional	250	the extent to which social cognitions (based on the Theory of Planned Behaviour; TPB) predict differences in breastfeeding intentions, initiation, and maintenance between White British (WB) and South Asian (SA) women.	Stronger intentions to breastfeed led to higher rates of breastfeeding amongst SA women. In turn, intentions were predicted by emotional and moral beliefs about breastfeeding, beliefs that were less positive amongst a WB sample.	1.50
Predicting mothers decisions to introduce complementary feeding at 6 months. An investigation using an extended theory of planned behaviour[21]	Australia	Cross-sectional	375	To investigate, via adopting a theory of planned behaviour framework and incorporating additional normative and demographic influences, mothers' complementary feeding intentions and behaviour.	the importance of attitudes, normative influences, and individual characteristics in complementary feeding decision-making which should be considered when designing interventions aimed at improving adherence to current maternal feeding guidelines.	1.50
Predictors of exclusive breastfeeding intention among rural pregnant women in India: a study using theory of planned behaviour[22]	India	Cross-sectional	218	To examine the exclusive breastfeeding intention and its predictors among rural pregnant women in Odisha state of India.	The study implies that appropriate breastfeeding education sessions need to be tailor-made for prenatal stage to improve exclusive breastfeeding intention and practice in rural Odisha.	1.36
Predicting breastfeeding in women living in areas of economic hardship: Explanatory role of the theory of planned behaviour[23]	UK	Cross-sequential	248	To investigate the factors underlying breastfeeding intention and subsequent breastfeeding at four time points in a sample of women selected from defined areas of economic hardship.	A model containing the TPB, additional variables and demographic factors provided a good prediction of both intention and behaviour – breastfeeding at birth, at discharge from hospital, 10 days after discharge and 6 weeks after discharge.	1.57
The Effect of Educational Intervention Based on the Theory of Planned Behavior in Pregnant Women and Individuals Affecting Their Exclusive Breastfeeding: A Controlled TrialWhat factors influence exclusive breastfeeding based on the theory of planned behaviour[24]	Iran	Quasi-experimental	90	To compare educational interventions based on the theory of planned behavior (TPB) in pregnant women and individuals influential to their exclusive breastfeeding (EBF) in the first six months of an infant's life.	In addition to pregnant women, their subjective norms should be considered in health education and promotion programs to improve EBF.	1.57
Experiences of infant-feeding decision-making among urban economically disadvantaged pregnant adolescent[25]	USA	poilt quality	17	To report a pilot study of influencing factors in disadvantaged urban pregnant adolescents' decision-making about infant-feeding choices.	Consistent with the Theory of Planned Behaviour and other research, attitudes, perceived social influences, and perceived control factors are influential to adolescents when choosing infant feeding methods.	1.40
Explaining variance in breastfeeding intentions and behaviors among a cohort of Mid-west mothers using a theory of planned behavior-based structural model[26]	USA	Longitudinal descriptive	100	To define a TPB-based structural latent variable model so as to define/explain variance in breastfeeding intentions and behaviors among a cohort of Midwest breastfeeding mothers.	Change in social norms, or a failure to capture the possible influence of social media and formula marketing on breastfeeding behaviors.	1.50

Table 1. General information of selected articles.

Article Based on “QualSyst”	Country	Study design	Participate(N)	Objective	Conclusion	Quality Assessment
Theory of planned behavior-based models for breastfeeding duration among Hong Kong mothers[27]	China	longitudinal descriptive	209	To evaluate cross-cultural application of TPB-based models for breastfeeding duration among new mothers in Hong Kong.Explained variance in PC and duration was high in all models. Overall fit of the strict TPB model was poor.	The TPB for breastfeeding employed women and the PC-mediated models fit equally well and residuals were small.	1.43
The extended Theory of Planned Behavior in explaining exclusive breastfeeding intention and behavior among women in Kelantan, Malaysia[28]	Malaysia	Prospective cohort	200	To utilize an extended Theory of Planned Behavior in identifying predictors of exclusive breastfeeding intention and behavior among women in Kelantan, Malaysia.	The women’s intention to practice exclusive breastfeeding may be improved by improving their perceived behavioral control and attitude. Providing correct postpartum support and skills to handle breastfeeding difficulties after delivery will improve their exclusive breastfeeding behavior.	1.64
Use of the Theory of Planned Behavior Framework to Understand Breastfeeding Decision-Making Among Mothers of Preterm Infants[29]	USA	qualitative		To determine the array of factors that contribute to breastfeeding among mothers of preterm infants.	Interventional studies geared toward breastfeeding promotion among mothers of preterm infants may focus on addressing barriers to direct breastfeeding during the neonatal intensive care unit and early post discharge time periods.	1.60
Predicting Exclusive Breastfeeding among Iranian Mothers: Application of the Theory of Planned Behavior Using Structural Equation Modeling[30]	Iran	Cross-sectional	304	To predict EBF among mothers with Infants Less than Six Months of Age (ILSMA) according to the Theory of Planned Behavior (TPB).	TPB is an appropriate model for predicting the intention and behavior of EBF. Policy makers and health system managers are recommended for taking some measures to add a standardized questionnaire in the electronic health record to predict EBF according to TPB of pregnant women and mothers with ILSMA.	1.21
Impact of intervention on breastfeeding outcomes and determinants based on theory of planned behavior[31]	China	Prospective cohort	285	To investigate the effectiveness of the TPB-based intervention program in improving exclusive breastfeeding, and the interaction of time and intervention on these determinants of breastfeeding.	This study indicated that the TPB-based intervention was effective in increasing exclusive breastfeeding rate at 3 days and 6 weeks postpartum.	1.36
Factors influencing the breastfeeding decisions of long-term breastfeeders[32]	Canada	longitudinal descriptive	317	To explain the intended and actual breastfeeding duration of 80 participants who were breastfeeding 9-month old infants.	This study demonstrated that the TPB can be used as a conceptual framework for explaining the psycho social factors that are relevant to long-term breastfeeding and how these factors may change in importance over time.	1.36

3.1. The TPB model of Breastfeeding

The TPB model was developed by Ajzen[33] by incorporating variables of perceived behavioral control into the theory of rational behavior. The TPB model’s behavioral attitudes (based on the advantages and disadvantages associated with the behavior), subjective norms (based on the perception of the behavior by significant others), and perceived behavioral control (based on the degree of control the individual feels in carrying out the behavior) make direct predictions on behavioral intentions. On the other hand, behavioral intention signifies the adoption, maintenance and direct prediction of behavior[8][34]. Based on the included studies, the TPB model’s core factors are equipped with strong explanatory powers for breastfeeding behavior[24,26,29,30]. A meta-analysis by Guo et al.[10] concerning 10 TPB studies of breastfeeding behavior with a total of 2,694 participants has revealed that breastfeeding intention is a significant predictor of breastfeeding duration, and that behavioral attitude, subjective norm, and perceived behavioral control are all important variables of predicting the breastfeeding intention.

It is highlighted in TPB that applying its models to explain various behaviors can be augmented to varying degrees by the three core variables of behavioral attitudes, subjective norm, and perceived behavioral control[8]. In the TPB model of breastfeeding behavior, breastfeeding knowledge[13,16,17,19,22,27] and moral norms[13,19,20,23,28] are frequently included by researchers as independent variables based on the characteristics of altruistic and experiential breastfeeding behavior. Moreover, as the key component of the self-efficacy theory of breastfeeding in theory, self-identity[13,23,24,28] is often involved in the TPB model of breastfeeding behavior. In addition, researchers have discovered that, after adding new variables, the three core variables of the TPB model can be explored by dividing each variable into two components as follows: breastfeeding behavioral attitude grouped as emotional and instrumental attitude[16,20,32], breastfeeding subjective norm classified as imperative and descriptive norm[14,20,21,23], and perceived behavioral control of breastfeeding sorted into perceived difficulty (self-efficacy) and perceived control[15,16,18,20] .

Lawton et al.[20] referred to a study that used TPB to explain risk-taking behavior. They then divided behavioral attitudes, subjective norms, and perceived behavioral control into two groups of variables and added moral norms to the TPB model for research. This explained 59.1% of the intention to breastfeed and 34.7% of the duration of breastfeeding. In a breastfeeding intervention study of UK mothers, Bartle and Harvey[15] included a distinction between breastfeeding self-efficacy and perceived behavioral control separately in the TPB model and added breastfeeding knowledge for research, and discovered that both breastfeeding knowledge and self-efficacy can significantly predict breastfeeding intention. Saffari et al.[13] integrated moral norms and self-identity into the TPB model for a longitudinal study of breastfeeding. The study concluded that the three core variables in the TPB model explained 49% of breastfeeding duration, whereas moral norms and self-identity explained 15% of breastfeeding duration. Combining the relevant studies based on the TPB theoretical model of breastfeeding at this stage, it can be concluded that the following TPB-based psycho-social factors influence breastfeeding behavior (see figure2. and Table2.).

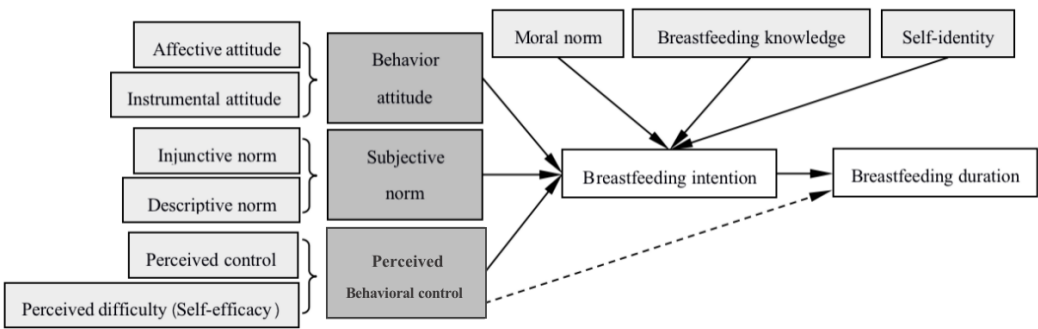


Figure 2. TPB-based psycho-social factors influence breastfeeding behavior.

Table 2. TPB-based psycho-social factors of selected articles.

Article	Behavior attitude	Subjective norm	Perceived behavioral control	Self-efficacy	Moral norm	Breastfeeding knowledge	Self-identify
	AA IA	IN DN					
[13]	*	*	*		*	*	*
[14]	*	* *	*				
[15]	*	*	*	*		*	
[16]	*	*	*	*		*	
[17]	*	*	*			*	
[18]	*	*	*	*			
[19]	*	*	*		*	*	*
[20]	* *	* *	*	*	*		
[21]	*	* *	*				
[22]	*	*	*			*	
[23]	*	* *	*		*		*
[24]	*	*	*				
[25]	*	*	*				
[26]	*	*	*				
[27]	*	*	*			*	
[28]	*	*	*				*
[29]	*	*	*				
[30]	*	*	*				
[31]	*	*	*				
[32]	* *	*	*				

AA affective attitude, IA instructional attitude, IN injunctive norm, DN descriptive norm
*: Hypothesize and measure the psycho – social factor.
* | *: Hypothesize and measure the two – fold psycho – social factors.

3.2. Impacts of psychosocial factors on breastfeeding

3.2.1. Behavior attitude (including affective and instrumental attitude)

Behavioral attitude, as the core concept of TPB, constitutes beliefs about the degree of positive or negative evaluation of behavioral outcomes[34]. Affective attitude is used to measure the extent of emotional outcomes and self-actualization of breastfeeding mothers, whereas instrumental attitude is utilized to assess the size of actual benefits of breastfeeding behavior[20].

Affective attitude toward breastfeeding, a practice that solely involves the mother, is used to determine whether the mother finds breastfeeding pleasurable and meaningful, e.g., "Breastfeeding makes me happy"[20]. A positive affective attitude toward breastfeeding means everything for mothers as it will enable them to enjoy breastfeeding, experience less depression, and increase their likelihood of attempting and adhering to breastfeeding independently[35]. The power of affective attitude in explaining breast-

feeding intention and duration considerably surpasses that of instrumental attitude. An inter-culture research[20] discovered that affective attitudes explained breastfeeding intention and predicted the duration of breastfeeding at 6 months postpartum, whereas instrumental attitudes did not predict the duration of breastfeeding.

Instrumental breastfeeding attitude is defined as the perception of the utility of breastfeeding, such as "I believe breastfeeding is beneficial to my child". Apart from the mother herself, the positive instrumental attitude felt by the father, paternal grandmother, or maternal grandmother of an infant significantly predicts the mother's breastfeeding intention[16,32]. However, despite their positive instrumental attitudes, a lack of experience or knowledge makes breastfeeding behavior more likely to end in the early stages. Therefore, researchers have detected no correlation between instrumental attitudes of father and the breastfeeding status of infant mothers[16] and instrumental attitudes of mother in law fail to predict the 9 mouths duration of breastfeeding[32].

3.2.2. Subjective norm (including injunctive and descriptive norm)

The subjective norm of breastfeeding is divided into the descriptive norm and injunctive norm. Descriptive norm represents what "significant others" do, such as by saying "My mother has breastfed for more than six months," while injunctive norm represents what they believe individuals should do, such as "My mother thinks I must breastfeed[14]." Subjective norms are the least influential of the three core factors of the classical TPB model based on the breastfeeding intention. Researchers have attempted to integrate descriptive norms into TPB models to heighten their explanatory power, but this has not been successful in breastfeeding behavior studies. According to the studies, when both injunctive and descriptive norms are measured, descriptive norm can predict breastfeeding intention but not breastfeeding duration while the injunctive norm has no effect on breastfeeding intention or duration[14,20,21,23]. In the study on breastfeeding in Australian mothers, the descriptive norm was used to understand the influence of other mothers' breastfeeding experiences, e.g., "Most mothers I know introduce solids when their babies are 6 months of age." However, this study showed that the descriptive norm of the relevant group was associated with breastfeeding behavior, but did not predict behavior[21]. Consequently, the subjective norm discussed below primarily refers to the injunctive norm as is the case in TPB.

The infant's paternal grandmother or maternal grandmother may influence the mother's breastfeeding behavior by asking "whether breastfeeding is good for the baby" and such perception generates the subjective norms felt by the mother whose breastfeeding intention is impacted accordingly[18]. The propensity of breastfeeding gets undermined if the advice of elderly ladies of a family is sought by the mother. The study of British families has found that the duration of exclusive breastfeeding is subject to the influence of infant grandmothers who aren't fully convinced about its benefits[15]. Subjective norms from hospital midwives and nurses with expertise in infant feeding, also deliver effects on mothers and in particular, new mothers [31]. It is discovered from an intervention study on Chinese mothers that stronger support from nurses and doctors in breastfeeding results in a higher maternal tendency to breastfeed[4]. However, the sampling studies of American, Chinese and Malaysia mothers, no matter intervention or cross-sectional study, also revealed an insignificant correlation between mothers' perception of subjective norms from midwives and the duration of breastfeeding[23,27,28].

3.2.3. Perceived behavioral control

Perceived behavioral control can be divided into perceived control and perceived difficulty[34]. Perceived control relates to the perception of external (objective) environmental factors, whereas perceived difficulty leans towards the perception of internal (subjective) competence factors and is associated with confidence in behavior performing[36]. Self-efficacy and perceived difficulty both affect the individual's capability to achieve a certain goal. In this regard, self-efficacy instead of perceived difficulty is generally employed

by researchers in the TPB model[37]. But self-efficacy is an independent variable that significantly predicts breastfeeding behavior in related studies, whose explanatory power exceeds that of the perceived behavioral control[15,18,20]. Researchers usually attach equal importance to breastfeeding self-efficacy and perceived behavioral control of breastfeeding as two independent influential factors. This research, therefore, examines the influence of breastfeeding self-efficacy on breastfeeding separately, and the perceived behavioral control to be discussed in the following sections refers to the infant mother's "perception of control" over the external world during breastfeeding.

Perceived behavioral control of breastfeeding is used to measure how mothers perceive their level of control over breastfeeding, e.g., "I am in a position to breastfeed[10]." Perceived behavioral control predicts breastfeeding intention directly, and mothers with high scores are identified as showcasing significantly stronger feeding intentions than those with low scores[31]. Nevertheless, the predictive value of perceived behavioral control on the duration of breastfeeding differs across studies. Bajoulvand et al[30]'s study on Iranian mothers indicates that perceived behavioral control can predict the duration of breastfeeding. However, no significant association between breastfeeding behavior lasting 6 to 8 weeks postpartum and perceived behavior control score has been identified in studies [15]. This has led to controversy about the results of studies on perceived behavioral control of breastfeeding.

3.2.4. Self-efficacy

Dennis[38] considered breastfeeding self-efficacy to be a factor independent of individual self-efficacy, which refers to infant mothers' perceived self-competence in effectively breastfeeding their infants. As proven by Bartle and Harvey[15] using linear regression analysis, breastfeeding self-efficacy has high explanatory power for breastfeeding behavior in a regression model with other TPB factors taken as control variables. This study presents a 47% explanation of breastfeeding self-efficacy for breastfeeding behavior. Breastfeeding self-efficacy is a substantially positive predictor of both breastfeeding intention and duration [11]. TPB-based Studies have demonstrated that self-efficacy influences the intention to exclusively breastfeed, influences the success of breastfeeding in the first two months after delivery, and lowers the risk of weaning [7,18,20].

In addition to the TPB framework, researchers have frequently employed the breastfeeding self-efficacy theoretical framework to examine the relationship between self-efficacy and breastfeeding behavior. Various effects of breastfeeding self-efficacy on breastfeeding behavior are identified at different phases of breastfeeding. The majority of breastfeeding behavior studies tend to measure breastfeeding self-efficacy in the prenatal and early postnatal period (24 hours to 3 weeks postpartum) for mothers. Researchers generally concur that early postnatal self-efficacy is a strong predictor of breastfeeding duration because early postnatal mothers who successfully breastfeed can confirm their ability to do so, develop self-approval, and continue breastfeeding[11]. However, if mothers encounter physiological breastfeeding difficulties after birth, they are more likely to "overcome" these challenges and continue breastfeeding if they have strong prenatal self-efficacy[39]. Although breastfeeding self-efficacy varies by stage, prenatal interventions on breastfeeding advice can help moms feel more capable of continuing to breastfeed after giving birth[40].

3.2.5. Moral norm

Moral norm refers to the sense of responsibility to perform or reject an act and the perception of "right and wrong" by individuals. Breastfeeding is subject to moral standards because of its typical altruistic characteristic[9]. The distinction between the subjective norm and moral norm is that the former refers to external pressure, while the latter emphasizes shame and guilt experienced by the individuals, e.g., "I would feel guilty if I did not breastfeed my child[13]." A systematic review of Chinese breastfeeding intervention study demonstrates that mothers informed of their breastfeeding responsibilities and potential consequences to their babies in the absence of breast milk before labor, would have a higher

sense of moral norm and the number of breastfeeding mothers will substantially grow[41]. The study of British mothers and the breastfeeding educational intervention study of Irish mothers both found that the moral norm could effectively predict breastfeeding intentions of mothers[19,23]. According to a cross-cultural study performed by Lawton et al.[20], the moral norm is second only to behavioral attitude as a strong predictor of intention and duration of breastfeeding behavior.

3.2.6. Breastfeeding Knowledge

Knowledge and information about breastfeeding impose significant effects on breastfeeding behavior. In the age of baby formula, in response to the popularity of breastfeeding viewed as "new knowledge", baby caregivers tend to exaggerate its adverse impact, by claiming that "breastfeeding may spoil the mother's body shape" and "a mother with hepatitis B can't breastfeed". Knowledge about breastfeeding is a strong predictor of breastfeeding intention and duration[27]. A survey on breastfeeding in China has revealed that among factors influencing breastfeeding intention, lactation knowledge is second only to behavioral attitude and exerts considerably a greater influence than the subjective norm or perceived behavioral control[4]. Mothers may access breastfeeding knowledge from a variety of sources including relatives and friends, online information, doctors and nurses, etc., but knowledge shared by midwives and nurses has been shown to impact breastfeeding most[31]. And the results of a breastfeeding intervention study based on the TPB model demonstrated that knowledge provided by midwives and nurses can significantly increase breastfeeding intention[17].

3.2.7. Self-identity

Self-identity in Breastfeeding refers to the infant mother's subjective interpretation of "what kind of mother I should be," such as "breastfeeding is a critical part of my motherhood" [28]. Bajoulvand et al.[30] conducted a study on Iranian mothers and discovered that self-identity in breastfeeding could significantly predict lactation intention but won't affect its duration. Nonetheless, a longitudinal study has revealed that self-identity plays a supportive role in encouraging infant mothers to stick to breastfeeding[13].

4. Discussion

In this paper, the psycho-social factors influencing breastfeeding behavior are investigated, including "why feeling powerless in breastfeeding" and "how to overcome powerlessness". TPB has been validated to some extent in the field of breastfeeding behavior research. However, the traditional TPB model itself, which only consists of the core elements (attitude, subjective norm, and perceived behavioral control), fails to sufficiently explain the psycho-social factors in breastfeeding behavior. For a more comprehensive and systematic interpretation of each psycho-social factor in breastfeeding behavior, researchers have upgraded the TPB model by adding new variables and distinguishing two components. In the extended TPB model of breastfeeding behavior, the psycho-social factors are proven effective in explaining infant mothers' breastfeeding intention and duration. However, improvement in the existing TPB studies on breastfeeding behavior in terms of integration, localization, and intervention studies is urgently required.

First, the TPB model for breastfeeding has been shown to effectively explain breastfeeding behavior through various studies, with the exclusion of some psycho-social factors whose explanatory powers are confirmed as insufficient. In the TPB study for breastfeeding, it turns out that attitudes and perceived behavioral control are able to adequately explain breastfeeding behavior, especially breastfeeding intention, whereas the influence of the subjective norm could not be identified. In addition to the core factors, certain factors (such as breastfeeding self-efficacy) possess strong explanatory powers for breastfeeding behavior at both the theoretical and empirical levels[7]. However, the descriptive norm, which is supposed to play a role in breastfeeding behavior, in theory, has been studied in a contentious manner[14]. Furthermore, psycho-social factors with sufficient explanatory

powers vary based on different breastfeeding scenarios. For example, the subjective norm and breastfeeding knowledge are significantly more influential among first-time mothers than among mothers with prior childbearing experience[15]. In future research on the TPB model for breastfeeding behavior, more in-depth studies on breastfeeding behavior will highlight the integration and validation of the TPB and the development of a recognized, accurate, and useful TPB model in the field of breastfeeding behavior research, and the utility and intervention efficacy of the TPB model in various breastfeeding scenarios are to be clarified.

Second, the majority of researchers have designed the extended version of the existing research model, rarely taking into account the society context of the behavior and often neglecting the influence of social or cultural-related factors exclusive to each breastfeeding behavior. For instance, COVID-19, as an emergency public health event in recent years, is something we cannot ignore when studying breastfeeding behavior. A narrative review study suggests that COVID-19 impacts breastfeeding differently, leading to distinctive mental health outcomes[42]. It has been suggested that COVID-19 affects specifically related behavior by influencing perceived behavioral control in TPB[43]. However, so far, there are no studies that can explore the relationship between COVID-19 and breastfeeding from the perspective of TPB. Another example is the phenomena such as the mother-in-law and daughter-in-law relationship and inter-generational parenting may influence breastfeeding behavior[44]. In contrast to Western families who view breastfeeding as a "sheer individual choice," the Eastern Asian who are generally edified by both collectivism and traditional Confucian culture, think it is more proper to take breastfeeding as a "family decision",in particular with the involvement of the baby’s grandparents[45]. Therefore, it is essential to consider the relationship between mother-in-law and daughter-in-law and "inter-generational parenting" when studying breastfeeding behavior in some Eastern Asian culture. The "mother-in-law and daughter-in-law relationship" is of paramount importance to understand the influence of descriptive and imperative norms on mothers by elderly ladies, and may be studied as a subjective norm. On the other hand, "inter-generational parenting" refers to an "upbringing condition" that must be taken into account by families in the decision-making process and may be involved in the TPB study of breastfeeding behavior as part of perceived control. It is thus suggested that localized TPB models of breastfeeding behavior based on the existing contexts with different cultural backgrounds be developed in future studies for the implementation of effective localized and empirical breastfeeding research and subsequent proposals of targeted interventions according to the results of empirical research.

Finally, relatively few intervention studies on the TPB model of breastfeeding behavior are currently available. Most of the intervention studies are limited to giving pregnant women basic information about breastfeeding or information about the responsibility of breastfeeding. Most of these studies focus on how to improve the altruistic beliefs of infant mothers[41]. In fact, breastfeeding has benefits for the mother as well as the infant, such as preventing infants mothers from breast cancer and boosting postpartum metabolism[1]. Breastfeeding is not yet universally recognized as an "altruistic and self-beneficial" reciprocal behavior. "Altruistic and self-beneficial" behavior can activate the predictive power of perceived behavioral control over behavior and increase the overall explanatory power of the TPB model relative to breastfeeding[46]. In addition, the majority of intervention studies have involved infant mothers who receive breastfeeding information passively, which can influence breastfeeding intentions but not duration[9]. Studies have demonstrated that the affective attitude and self-efficacy of infant mothers are more powerful predictors of breastfeeding intention and duration than other factors[20], indicating that the ability of mothers to "actively choose" to breastfeed is essential to enhancing breastfeeding behavior, making mothers more likely to feel satisfied and confident. This suggests that the ability of mothers to choose to breastfeed is crucial to improving breastfeeding behavior, making it easier for mothers to achieve satisfaction and continue breastfeeding. Therefore, it is

possible to raise the incidence of breastfeeding in future intervention studies by increasing the transmission of "self-interest beliefs" and "active choice" messages.

There are still some limitations to this literature review that need to be noted. First, although this study uses the database to collect and organize the existing articles where possible, some gray literature and unpublished literature are still difficult to collect and there is a problem of data legacy exists. Second, this literature review could not be meta-analyzed, due to the insufficient amount of articles after screening. Third, the study scope was restricted by limiting the included literature to breastfeeding behavior of infant mothers, and it is incapable of exploring the adaptation of TPB to a broader range of breastfeeding-related behavior, such as adolescent breastfeeding education and breastmilk banking.

Regardless of the above constraints, this study is still capable of reviewing the present TPB model for explaining breastfeeding behavior based on the screened literature. The narrative review of this study has led to the following conclusions: the researchers extend the TPB model by adding new variables and distinguishing between two groups, allowing for a more comprehensive and systematic explanation of the effects of various psychosocial factors on breastfeeding behavior. The affective attitude, instrumental attitude, subjective norm, perceived behavioral control (including self-efficacy), moral norm, breastfeeding knowledge, and self-identity in the TPB model of breastfeeding are all effective in explaining infant mothers' breastfeeding behavior.

For babies who are new to this world, breastfeeding is the way to provide them with love and food at the same time. May we encourage breastfeeding through the TPB study on breastfeeding behavior, so that life may be treated with kindness.

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